beyond the reach of any loosely applied or internally administered germicide. The particular infestations for which we have chemical specifics, namely, malaria, syphilis, etc., are, if one recalls, not due to bacterial infection but to parasitic infestations other than bacteria. I know of no single disease against which there is a chemical specific, when that disease is caused by cocci or bacilli.

To look for these ideal shortcuts in urological practice often means that the one so looking is either lazy or dodging the issue. Accurate urologic diagnosis means precise and painstaking work. As a rule there is no substitute for this as a preliminary efficient therapy. It is a sad commentary on the physicians to be carried away by such fads simply because of glaring promises by enthusiasts.

THE PRACTICAL VALUE OF THE INTRACUTANEOUS TUBERCULIN TEST

By ROLAND P. SEITZ AND LLOYD B. DICKEY *

(From the Division of Pediatrics, Stanford University Medical School)

In a small number of patients we find the size of the tuberculin reaction in children classified as active to be much larger than the average.

In our hands the D'Espine sign was valueless.

The extent of the bronchial markings in the roentgenograms of the chest may be significant in suspected tuberculosis. The amount of calcification showed no correlation with other evidences of tuberculosis.

The local incidence of tuberculous infection would seem to be about 25.2 per cent for all children under age fourteen and 42.6 per cent between twelve and fourteen. This is lower than reported for other urban communities.

We believe that a routine tuberculin test is warranted in all children regardless of their complaints.

A positive tuberculin test should indicate a complete investigation, including roentgenograms of the chest.

DISCUSSION *by Harold K. Faber, San Francisco; Clain Fanning Gelston, San Francisco; William C. Voorsanger, San Francisco.*

SINCE Von Pirquet [1] first established, in 1908, a method to detect tuberculous infection by a skin test numerous reports have appeared in the literature.

The following study was undertaken with the support of the San Francisco Tuberculosis Association. The work was started to determine the incidence of this disease for this vicinity; to correlate the history, physical and radiological findings and from these to determine the practical value of the tuberculin test.

While the work is as yet only in the initial stage, enough data have accumulated from which, we think, to draw preliminary conclusions.

In our study five hundred children, ranging in age from infancy to fourteen years, were tested. They were from the Stanford children's clinic, unselected, and taken regardless of complaints. The intracutaneous method was used and a uniform standard dose was given. This was 1/10 cc. of a 1:1000 solution of Koch's old tuberculin in normal saline thus making a standard of 1/10 mg. of tuberculin for each patient. The test was done on the flexor surface of the forearm and controlled with an intracutaneous injection of 1/10 cc. of normal saline solution, given at some distance below the tuberculin test.

Happ and Casparis [2] advise the use of a control solution containing an amount of glycerine broth equivalent to that in old tuberculin. The use of a control while theoretically correct is not a matter of general practice, probably because protein reactions, such as might be obtained from broth without bacterial growth, fade quickly and have disappeared at the end of the twenty-four or forty-eight hours when clinic patients present themselves for inspection. In hospital patients it is not uncommon to see these transient reactions.

An erythema five mm. in diameter at forty-eight hours was taken as the minimum positive tuberculin reaction. On those patients with positive reactions a history was taken, a physical examination performed and a roentgenological examination made of the chest. An attempt was made also to obtain body temperature at four-hour intervals over a period of five days. This was found to be impractical, as were sputum examinations, except in patients who later entered the hospital.

Of the five hundred children tested 126, or 25.2 per cent, reacted positively and 374, or 74.8 per cent, negatively.

The age incidence of the positive ones was tabulated with the following result:

TABLE I

Age	Male			Female			Total		
	No. done	No. pos.	% pos.	No. done	No. pos.	% pos.	No. done	No. pos.	% pos.
Under Age 4	47	8	17.0	62	4	6.4	109	12	11.0
4 to 8	98	24	24.5	95	22	23.2	193	46	23.8
8 to 12	81	26	32.1	63	19	30.2	144	45	31.2
12 to 14	31	14	45.2	23	9	39.1	54	23	42.6
Totals	257	72	28.0	243	54	22.2	500	126	25.2

If this incidence is graphically charted (Chart I), it shows a steady rise in the percentage of positive reactions directly proportionate to the ages of the patients male and female.

The rest of this paper will deal entirely with patients who reacted positively; study of negatives is pending.

Attention was concentrated on the tuberculin reaction. In nearly every instance induration was present with a considerably larger area of erythema peripheral to it. The induration was considered the more significant and formed the basis for our measurements. It averaged a little less than 14.5 mm. in diameter. The six patients with active tuberculosis averaged nearly twice this or 23.5 mm. Three of these had active bone foci in addition to those in the lungs.

Analysis of the histories of the positively tuberulous patients revealed that the total number of males was approximately 28 per cent of those tested, females, 22 per cent.

About 60 per cent of all patients gave no history

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Lloyd B. Dickey (Stanford University Hospital, San Francisco). **M. D.** University of Minnesota, 1923; **A. B.** Fargo College, 1915; **M. A.** University of Illinois, 1917; **B. S.** University of Minnesota, 1921; **B. M.** University of Minnesota, 1923. **Graduate study:** State Hospital for Crippled Children, Phelan Park, St. Paul, Minn., 1923; Hennepin County Tuberculosis Sanatorium, Oak Terrace, Minn., 1923; Lane Hospital, 1924-26. **Previous honors:** Graduate Assistant in Zoology, University of Illinois; Instructor in Anatomy, University of Minnesota; Assistant in Medicine, University of Minnesota; Assistant in Morphology, Puget Sound Marine Biological Station. **Present hospital connections:** Lane Hospital, Pediatrics. **Present appointments:** Instructor, Department of Medicine, Division of Pediatrics, Stanford Medical School. **Practice** limited to Pediatrics since 1924.

of exposure to tuberculosis, 23 per cent a definite history. Of the latter, 3 per cent had a history of double contact. In slightly over 7 per cent the history was doubtful and in about 9.5 per cent it was unknown.

Complaints at the time of examination were varied. Eleven, or slightly over 8.5 per cent, of the 126 positives came to the clinic for examination because of exposure to tuberculosis in the home. Of the remaining patients 27, or about 21.5 per cent, had complaints which might be considered suggestive of a tuberculous infection. Chronic cough, failure to gain weight, marked underweight, night sweats and hoarseness were among these. Eighty-eight patients (about 70 per cent) had complaints not suggestive of tuberculosis.

Since both measles and pertussis have been said to predispose to tuberculosis infection we obtained, where possible, the history in regard to these infections: 62 per cent had a history of pertussis, 21 per cent negative and in 17 per cent the history was unobtainable. Fifty-eight per cent had had measles, 25 per cent negative, and in 17 per cent the history was not obtained.

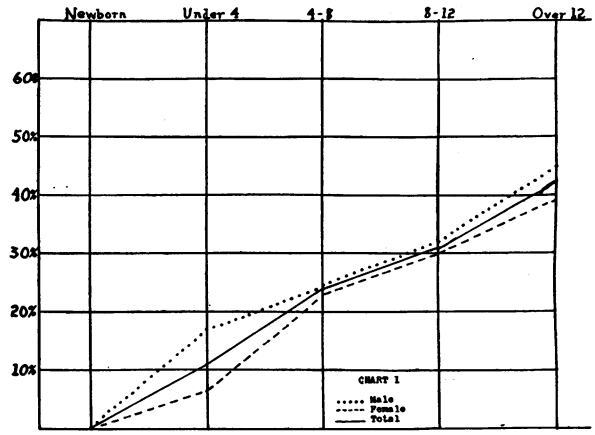
In only seven patients, slightly over 5 per cent, could we obtain a history of phlyctenular conjunctivitis. Of these, five were of girls and two were of boys, the youngest 2½ years.

Of the patients examined, about 39 per cent had had their tonsils and adenoids removed. In the remainder these might be considered as a focus of infection.

In considering the weights, we arbitrarily accepted all that were less than 10 per cent above or below the average for height, age and sex, as normal. Baldwin-Wood standard weight tables were used to determine variations. Eighty-six patients, or 68.2 per cent, were within the standard limits of normal weight; twenty-six patients, or about 20.5 per cent, were 81 to 90 per cent of average weight; Four patients, or over 3 per cent, were 80 per cent or under. Six patients, or 4.7 per cent were 111 to 120 per cent of average weight; in two the weight was over 120 per cent of the average, and in two the weight was not taken.

Many of our patients were children too young to permit the elicitation of the whispered or spoken voice and in them we considered dullness at, or below, the spine of the fourth thoracic vertebra as equivalent to a positive D'Espine sign. In the remainder, the complete D'Espine Test was carried out by means of the spoken and whispered voice. Thirty-three, or about 26 per cent, gave a positive D'Espine Sign. Of these, 16 showed signs of enlarged tracheo-bronchial nodes in the roentgenograms and 17 did not. In 83 or about 66 per cent of the children examined, the D'Espine sign was negative. Thirty-one of these, or 24.5 per cent, gave roentgenological evidence of tracheo-bronchial glandular enlargement, and 52, or about 41 per cent, were negative. In ten patients it was not possible to examine for this sign.

These results make it evident that the D'Espine sign was of doubtful value in this series. This was also the finding of a committee appointed by the National Tuberculosis Association.[3]



Definite paravertebral dullness was present in ten of the children examined; 47, or about 37 per cent, showed radiological evidence of enlargement of the tracheo-bronchial lymph glands, and 69, or about 55 per cent, showed no such evidence, in ten, roentgenograms were not taken.

The extent of the bronchial markings in the lung fields was noted. These were grouped into three classes on the basis of their extent into the lung parenchyma. The lung fields were divided into thirds by lines concentric to the outline of the chest. The inner field was called the first; the intermediate the second and the peripheral one the third.

Of 121 patients in whom roentgenograms were taken, six, or about 5 per cent, showed bronchial markings extending only within the limit of the first field; 94, or over 77 per cent, extended into the second zone and 21, or about 17 per cent, ran into the third.

The amount of calcification was graded by counting the actual number of apparently calcified areas in the lung fields. The findings were placed in three groups. Those having three or less of these areas were graded one plus; those having more than three and less than twelve, two plus; and those having more than twelve, three plus. Of the 121 children, three showed no discernible calcification; 23, or 19 per cent, were placed in the first group; 76, or about 63 per cent, in the second group and 19, or 15.7 per cent, in the third group.

We searched in every roentgenogram for a primary parenchymatous lung focus such as Ghon[4] demonstrated to be present in nearly every child with tuberculosis. All areas of calcification outside of the hilus region were accepted as primary foci except old calcified cavities which were almost certainly tuberculous. Doubtful areas were not included. Eighty-seven, or 72 per cent of our children, showed one or more lesions such as we have mentioned and 34, or 28 per cent, were negative. Only two had cavities and in one of these the cavity was almost certainly healed.

On the basis of all the data at hand, namely, the history, physical examination and roentgenogram, we attempted to classify patients as either active, suspicious or healed. This was done without reference to the tuberculin test. No child was found who could be considered absolutely negative: six, or 5 per cent, were placed in the active group; 24, or 19 per

cent, in the suspicious group and we concluded that 91, or 76 per cent, had healed lesions.

It will be noted that all of the patients with positive tuberculin reactions showed other evidence of tuberculous infection. The 42.6 per cent between 12 and 14 years who reacted positively might therefore indicate the incidence of tuberculous infection for the residential area at this significant age period. This incidence, 42.6 per cent, is much lower than that usually reported with the less sensitive Von Pirquet test for this age group. Such studies from the larger cities are shown in the following table:

TABLE 2

Author	Date	Location	Age Yrs.	Number tested	Per cent positive
Hamburger and Monti [5]	1909	Vienna	12-14	*53	94.3
Von Pirquet [6]	1907-08	Vienna	12-14	81	81.5
Hoffa [7]	1919-21	Barmen	11-14	206	63.1
K. Barchetti [8]	1917-21	Gratz	11-14	158	58.0
Ferguson [9]	1921	Saskatchewan	10-14	795	57.4
Veeder and Johnson [10]	1915	St. Louis	12-14	*112	48.0
Sill [11]	1918	New York	10-13	27	48.0
Furstner-Risselada [12]	1921	The Hague	12-13	117	46.3
Slater [13]	1924	Minnesota, rural	12-14	383	12.0

* Hospital children.

In those children reacting positively we wish to emphasize the relative importance of certain roentgenological findings in diagnosis.

While only 13.2 per cent of our patients with healed lesions showed increased bronchial markings extending into the third zone, 25 per cent of those with suspected tuberculosis, and 50 per cent of the active ones, reached this area.

The amount of calcification was not, however, as helpful. Sixteen and three-tenths per cent of those children with healed lesions showed the same marked degree of calcification as that noted in a similar proportion of those with suspected and of unquestionably active tuberculosis.

We advocate a routine tuberculin test on every child. We feel that most of the thirty with active and suspicious tuberculosis, constituting 34 per cent of the positive reactors and 6 per cent of the 500 children tested, would have escaped detection or diagnosis for a much longer period were it not for the thorough examinations they were given simply because of the positive skin tests.

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DISCUSSION

HAROLD K. FABER, M. D. (Stanford University Hospital, San Francisco)—It is the policy of the San Francisco Tuberculosis Association, under whose auspices the present study has been carried out, to concentrate its forces on the problem of tuberculosis in childhood. The reasons for this policy need no explanation to the medical profession. Essential to the prevention and control of the disease in any community is a survey of the local field to estimate how heavily it is infected. To obtain this knowledge we should be able to study a series of representative cross-sections of the community, examining a large number of unselected individuals, sick and well. While these conditions are not ideally attainable, we have in our children's clinics a fair approximation to them, dealing as they do largely with patients coming for minor complaints and increasing numbers with none. The study of the incidence of the tuberculin reaction here presented, which is part of a general survey in conjunction with the University of California children's clinic, therefore supplies us with the basis for an estimate of the magnitude of the tuberculosis problem among the children of San Francisco. Such studies are invaluable and should be carried out in every large city as a sort of stock-taking.

It is worth pointing out to the general practitioner that, although it is a little more difficult, the intracutaneous method of testing is far more reliable than the Pirquet scratch test. As used by the authors of the present paper, the test gives about 80 per cent positives in infected children as against 50 per cent for the scratch method. This has been shown clearly by Happ and Casparis.

CLAIN FANNING GELSTON, M. D. (384 Post Street, San Francisco)—In an analysis of over three thousand Von Pirquet reactions performed at the University of California Hospital outpatient department, the group being unselected children, our percentage of positive reactions was higher in spite of the fact that, unquestionably, the intradermal reaction is more sensitive. On the other hand, for the age groups, the curve in our series followed very closely that of Seitz and Dickey.

The point brought out in our investigation, and of great interest to me, was that in relation to the incidence of measles and whooping cough as a forerunner of tuberculous infection, our figures were practically identical with the two diseases in both the positive and the negative reactors, namely, 42 per cent. This, of course, does not mean that these two diseases do not have a great influence on the course of the disease, should tuberculosis infection be acquired. It also does mean that one should not be unduly alarmed, given a child showing, for instance, tracheo-bronchial adenopathy and such a past history, that the process is tuberculous without other confirmatory evidence.

Statistical papers such as this one, based on carefully controlled and scrupulously honest studies, are of immense value in determining the incidence and in helping us to control the prevalence of many diseases.

WILLIAM C. VOORSANGER, M. D. (490 Post Street, San Francisco)—The excellent work done by Seitz and Dickey at Stanford Clinic and certain conclusions reached, justifies the fostering of this experiment by the San Francisco Tuberculosis Association. We are interested primarily in ascertaining, (1) whether the contact of young children with tuberculous relatives induces active tuberculosis, and (2) whether through routine painstaking examination active tuberculosis can be discovered in early childhood. The authors have stated that in 60 per cent of their

children there was no exposure to tuberculosis, and only 8.5 per cent of their 126 "positive cases" came because of exposure to tuberculosis at home. These figures are at variance with accepted belief and if continued may change our present point of view that contact with infected surroundings is a leading etiological factor in the causation of tuberculosis in young children.

The point which principally impresses me in this paper is that the authors use the cutaneous tuberculin test merely as an indicator, not as a positive diagnostic sign, drawing conclusions only after a complete clinical and x-ray examination. Fishberg does not believe that children between three and five years of age with positive skin reactions are doomed necessarily to active phthisis. The authors themselves have shown that the smallest per cent of positive reaction (6.4 per cent) occurs under age four. At this age, or before, we should like to detect the incidence of tuberculosis, not in later ages after it has become active. The largest percentage of positive reactions in the patients of Seitz and Dickey was between twelve and fourteen years. Were not many of these in patients with healed lesions and if so what percentage? The authors have rightly shown the valuelessness of the once-accepted D'Espine sign, with which view most clinicians agree and stress their x-ray findings. Armand-Delille at the Herold Hospital, Paris, uses the x-ray routinely in infants under one year of age and places great diagnostic importance on his roentgenological findings.

The present authors have made an interesting classification with their three groups of x-ray findings, based upon involvement of lung parenchyma. Perhaps greater study and investigation along this line may help to diagnose tuberculosis in the young infant. We who treat principally adult tuberculosis realize that the disease can only be eradicated by detecting and controlling it in infancy. The work just presented should be continued because it is not only of scientific interest, but of benefit to the community at large.

AUTHORS (closing)—As noted by Voorsanger, the largest percentage of positive reactors was in the twelve- to fourteen-year group, and most of these gave evidence of healed lesions. All of the children with active tuberculosis were younger than this.

We wish to thank Doctors Faber, Gelston, and Voorsanger for their interesting discussions.

Simple Classification of Goiter—J. Earl Else, Portland, Oregon (Journal A. M. A.), presents a pathologic and a clinical classification of goiter, the latter being an amplification of the former. Else holds that the term goiter should be limited to those pathologic processes that directly result from an iodin deficiency. There are two main divisions in his classification: colloid and hyperplastic. The second group is divided into the cellular and the acinar. The cellular is divided into the nontoxic and the toxic; the latter into adenoma, adenomatosis or diffuse adenomatous and compensatory hyperplasia. Each of these groups is further subdivided into the nontoxic and toxic. The clinical classification is based on the presence or absence of the symptoms and signs of hyperthyroidism. If there is no evidence of hyperthyroidism, the process is spoken of as simple or nontoxic; but if there is evidence of hyperthyroidism, it is then referred to as toxic. The acinar type always begins as simple or nontoxic and then later often becomes toxic. True colloid goiter is never toxic, but sometimes there is hypofunction due to alteration in cell shape lowering its activity in addition to the primary iodin deficiency. This classification meets the requirements in being simple, including all primary pathologic processes, covering all the clinical types, being descriptive of each, and not adding a single new term to an already overcrowded literature.

Sulpharsphenamin in Treatment of Warts—In the treatment of plane warts of the face, Richard L. Sutton, Kansas City, Missouri (Journal A. M. A.), secured very satisfactory results from the intramuscular injection of sulpharsphenamin. The average dose has been 0.4 gm., and only sulpharsphenamin has been employed. The drug is dissolved in a minimal amount of sterile water, and injected directly into the gluteal muscles. In each instance only one injection was required.

PULMONARY NEOPLASMS †

A DISCUSSION OF THEIR INCREASING PREVALENCE DIAGNOSIS AND TREATMENT

By C. E. ATKINSON *

LUNG TUMORS occur more frequently than commonly supposed. Recent statistics reveal a considerably larger number of primary lung cancers—an increase in part due to greater diagnostic acumen, but in part actual. As a cause, evidence points most strongly to the influenza epidemic.

The symptoms of tumor and tuberculosis are almost identical, but the age periods are usually different. However, carcinoma tends to appear earlier in life than formerly. Yet if symptoms first appear after 40, cancer should be kept in mind. Pain, often prominent, tends to occur early, to persist or recur and to progress. Often worse at night, it may seem deep in the chest. Pain persisting after effusion forms is especially suggestive. Pain may be referred to the epigastrium; or shoulder and arm pains may occur with sympathetic phenomena and simulate a cord or meningeal lesion. Pronounced throat symptoms may occur just as in pulmonary tuberculosis without laryngeal signs. Dyspnea disproportionate to the general condition, cyanosis, and venous obstruction are of particular import. Sanguinous pleural effusion occurs in both tuberculosis and cancer. A fluid which becomes bloody only after repeated tapping, which gives but temporary relief, is said to have special diagnostic value. In tuberculosis it is claimed the fluid is more often bloody on a first tapping and subsequently clear, and tapping usually relieves. Currant-jelly or prune-juice sputum is said to favor cancer. Rarely, tumor particles are expectorated, and certain polymorphous sputum cells are held pathognomonic. A normal pulse with fever is said to suggest cancer. Weight loss and cachexia develop later in lung cancer than in other malignancies.

Many now believe the local irritation from tuberculosis may give rise to cancer; and the two diseases not rarely coexist.

Physical signs are often negative and usually indefinite, which in itself is suspicious. Over the tumor, flatness tends to develop, and if accompanied by weak or absent breath sounds without rales, this is against tuberculosis, but may cause confusion with fluid or abscess. A neoplasm tends to push the heart and trachea to the opposite side, while scar shrinkage from tuberculosis draws these organs toward the affected side.

Special methods include the use of the bronchoscope and endoscope, which in skilled hands may yield valuable data. Roentgen study though ex-

† Abstract of an article read before the Section on Tuberculosis of the Los Angeles County Medical Society, May 25, 1926.

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